

**Four Corners Air Quality Task Force Meeting
Oil & Gas Work Group – Small Engine/Large Engine Subgroup
Initial Conference Call: May 15, 2006**

Participants: Cindy Allen, CDPHE; Mike Brand, Cummins; Dave Brown, BP; Jim Cue, Caterpillar; Bob Gonzales, Caterpillar; Casey Osborn, EMIT
Absent: Ryan Dupnick, Compliance Controls

Small Engines

The following determinations were made relative to the list that was developed during the brainstorming session for the Oil and Gas Work Group. As shown below, some of the items have been recommended for deletion. Others have been assigned to individuals to draft information on the technology using the mitigation options template. Here is a listing of each item that was listed from the brainstorming session and the assigned person who will coordinate writing a first draft on the technology.

- Install electric engines **(Dave Brown will write first draft)**
- NSCR/3-way catalysts **(Casey Osborn will write first draft on the emissions section include AFR reference, periodic monitoring and maintaining O3 sensors; Mike Brand will incorporate the NH3 (ammonia) component and will supplement with information from Jim McCarthy of Innovative Environmental Solutions and Colorado State University)**
- Lean Burn **(Bob Gonzales will write first draft)**
- Air to fuel ratio (AFR) **(Casey Osborn will include AFR options/technology with NSCR/3 way catalyst along with exhaust gas analyzers and types of products that exist)**
- Utilize exhaust gas analyzers to adjust AFR **(Casey Osborn will write-up along with economics of gas analyzer/flue gas testing)**
- Preventative maintenance **(Mike Brand will write first draft and incorporate proposed regs.)**
- Optimization: optimize what is used to match hp needs **(Dave Brown will write first draft)**
- Centralization – replace a lot of small engines with one big one **(Dave Brown will write first draft and will combine “Optimization” with this section)**
- Permitting based on actual emissions **(Deleted: does not reduce emissions and not mitigation; may be for the cumulative affects group)**
- Emission limit on existing engines (1g/hp hr and 2g/hp hr) **(Will highlight the emissions reductions in the other mitigation option drafts but will not be treated as a separate category. Depending upon the draft mitigation options, this item may remain separate but this will be determined later)**
- Replacing ignition systems to decrease false starts **(Casey Osborn will write first draft)**
- Replace piston rod packing (pumps) **(This was deleted as a separate item and instead will be included with O&M section)**
- Oxidation catalysts on lean burns **(Casey Osborn will include with NSCR catalysts)**

*** Note: Mike Brand will include a draft of proposed regulatory requirements (i.e., NSPS requirement)**

Large Engines

All of the above plus...

- SCR (**Mike Brand will write first draft and address ammonia slip issue**)
- Install 4 cycle lean burn engines with oxidation catalysts (**Casey Osborn is handling with small engine draft**)
- Install rich burn with NSCR (**Casey Osborn will use draft for small engines and modify as appropriate for large engines**)
- Minimize (control?) engine blow downs (**This was deleted since it is not an emission control technology**)
- Smart AFRC (air-fuel-ratio-controller) (**Casey Osborn will write first draft; will include Ameritech information and will get with Ryan Dupnick for additional input**)
- Industry collaboration ("Change Champions") to drive market innovation (e.g. engine manufacturers) (**Dave Brown will write first draft and discuss industry demand and coordination**)
- Replace gas engine starters with electric air compressors (**This was deleted since it is not an engine emission control technology**)
- Provide training for field personnel on engine maintenance with regard to AQ considerations (**Mike Brand will write first draft**)

Next Steps

- Have first drafts circulated to the group by Tuesday, May 23rd. Comments, changes, etc. on each document will be forwarded to the author. Next conference call will be Tuesday, May 30th at 1:00 MDT. Dave Brown will send out reminder with call-in number.

Four Corners Air Quality Task Force Meeting
Oil & Gas Work Group – Overarching Options Drafting Team
Initial Conference Call: May 16, 2006

Participants: Mike Lazaro, Argonne; Walt Brown, BLM; Bill Hochheiser, DOE; Cindy Allen, CDPHE; Fran Brown, SUITGF; Mark Jones, NMED

Federal Land incentives

Walt - Timing restrictions in winter for wildlife, especially in CO, some lands closed in winter and may have some opportunity for mitigation measures for year round drilling.

Adding additional option of providing incentives on Federal lands for allowing year round drilling.

Mitigation Options

- Federal Land incentives for year round drilling – Bill
- State Government tax incentives – Fran
 - Generally talk about agencies working with legislators to craft incentives for real emission reductions.
- Emissions trading programs – Mike
- Natural Gas Star/Vista like programs – Mike and Mark

Scheduling

Preliminary Drafts by May 31st. Drafts due June 9th to larger group. Do some internal review before that.

**Four Corners Air Quality Task Force
Oil and Gas Workgroup -- Rig Engines Drafting Team
Initial Conference Call: May 17, 2006**

Participants: Cindy Allen, CDPHE; Brittany Benko, BP; Carl Daly, EPA Region 8; Cindy Beeler, EPA Region 8; Jason Sandel, Aztec Well Service; Bart Myers, Caterpillar

Next Teleconference: June 7, 9:00 – 10:00am (MDT)

Meeting to Select Mitigation Option Development

Review of Mitigation Options

Additions to Mitigation Options List by Carl

- Fuel Emulsions
- Liquid Combustion Catalyst
- Lean NOx Catalyst
- Exhaust Gas Recirculation (EGR)
- Low NOx ECM

Selected for Mitigation Option Development

- Natural gas powered rig engines (Brit)
 - Discussion concerning availability of natural gas, amount required, natural gas allocation, cost to retrofit
- SCR & NSCR (Brit)
 - Discussion concerning effect on ammonia emissions, include in burdens
 - Carl to send Brit ENSR presentation
- Ultra low sulfur diesel fuel (Bart)
 - Discussion concerning ability to use in what engines?
- Tier 2-4 engine standards (Carl) ⇒ Brit, Bart, Jason
 - Include feasibility discussion of accelerating implementation
- Fuel Emulsion (Carl)
 - Injection of water, what is the impact to maintenance costs

Mitigation Options to be completed and distributed by May 31

Other Mitigation Options & Discussion Points

- Analysis of all drill rigs – replace the dirtiest 20%
 - Will reference in Tier 2-4 Mitigation Option Development, but also move to overarching discussion to determine the priority on rig engine reductions

- Electric powered drill rig

Not selected due to low feasibility around availability of electricity, but EPA still interested so may be picked up later. Discussion concerning emission trade-offs (natural gas vs. coal-fired power plant)

- Duel fuel (or Bi-fuel) diesel and natural gas
- Bio diesel
- PM Traps
- Free gas recirculation
- Fuel Additives
- Liquid Combustion Catalyst
- Lean NOx Catalyst
- Exhaust Gas Recirculation (EGR)
- Low NOx ECM

No mitigation option development planned at present: these were considered to have a lesser air quality benefit than the ones selected above. Also, the number of options was greater than the writers. Anyone who would like to write up papers from this list is welcome to do so. Please contact Cindy Allen.

Four Corners Air Quality Task Force Meeting
Oil & Gas Work Group – Mobile and Non-road Drafting Team
Initial Conference Call: May 22, 2006

Participants: Mark Dalton, Samson; Lisa Wenn, XTO; Bruce Gantner, Conoco Phillips; Cindy Allen, CDPHE; Dale Wirth, BLM

The group discussed and decided that there were two major categories of the options that were listed in Farmington: dust mitigation and combustion emissions.

Dust Mitigation

- Preventative: Reducing truck traffic: Includes Optimize produce water handling, routing management, centralize facilities, Enforcement of speed limits (Mark)
- Reactive: Treating roads to reduce dust: Includes Fugitive dust control plans, produced H₂O for dust reduction (Dale)

Combustion Emissions

- Reduce miles driven (Bruce)
- Controls: fuel efficiency, exhaust testing (Lisa)

Timeline

Internal drafts due: 5/31/06

Meet to discuss drafts: 6/7/06

Drafts to Cindy: 6/9/06